Design and Development of a Dashboard System for Monitoring Operational Plans for Organizations

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Abstract

This study on the design and development of a dashboard system for monitoring organizational action plans aimed to explore the creation of a dashboard for reporting progress on strategic performance indicators and to analyze data management methods that enhance the effectiveness of information presentation. Data were collected from 30 personnel at Suan Sunandha Rajabhat University.

The findings revealed that the design and development of the dashboard using Looker Studio (Data Studio) provided an effective approach to data visualization. The appropriateness of transforming traditional reports into a dashboard format was rated at the **highest level** ($\overline{x}$ = 4.63). The use of multiple chart types was also rated at the **highest level** ($\overline{x}$ = 4.43), while combining charts with numerical tables was rated at a **high level** ($\overline{x}$ = 4.18). The use of two colors in dashboard design was rated at a **high level** ($\overline{x}$ = 4.43), whereas the use of three colors received the **highest rating** ($\overline{x}$ = 4.68). To ensure clarity, the dashboard design adopted no more than three colors: **green** representing "Achieved," **yellow or orange** indicating "Ongoing (NA)," and **red** signifying "Not Achieved."

Regarding data management and presentation, user satisfaction with the dashboard system was found to be high. Report completeness was rated at the **highest level** ($\overline{x}$ = 4.23); report accuracy at a **high level** ($\overline{x}$ = 4.68); aesthetics at the **highest level** ($\overline{x}$ = 4.68); ease of use at the **highest level** ($\overline{x}$ = 4.90); and clarity of communication at the **highest level** ($\overline{x}$ = 4.68). Overall, user satisfaction with the dashboard reporting system was rated at the **highest level** ($\overline{x}$ = 4.70), with general satisfaction also rated at the **highest level** ($\overline{x}$ = 4.67).

Keywords: Design , Develop , Dashboard

1. Introduction

In the present era, organizations increasingly rely on document-based reporting; however, the rapid transformation driven by digital technology has accelerated the shift toward digitalization. Digital technology has become an essential tool for improving the efficiency and effectiveness of organizational operations. Government agencies and higher education institutions are particularly required to adopt technology in order to enhance operational efficiency and respond to societal needs quickly and accurately.

In this context, a **Dashboard system**, which enables real-time data visualization and allows administrators and personnel to rapidly access critical information, has emerged as a highly relevant and appropriate tool for monitoring organizational action plans. This approach aligns with Thailand's **20-Year National Strategy**, which emphasizes multidimensional national

development, particularly in the digital domain, with a focus on strengthening data utilization and technological capabilities across all sectors. (Office of the Permanent Secretary).

Similarly, Suan Sunandha Rajabhat University has emphasized the development of academic support personnel under **Strategic Goal 2: Enhancing mission-driven operations through digital technologies and good governance**. The university aims to establish an integrated information technology system that effectively connects internal data. The strategy focuses on fostering a digital organizational culture and preparing the institution to adapt to changes in the digital era. Real-time data utilization is highlighted as a key component, encouraging units to adopt technological tools for communication, information dissemination, and performance reporting in digital formats. Such transformations are essential for personnel, enabling them to apply digital tools and technologies effectively in their work. This also provides learners with opportunities to apply these technologies in business and daily life, supporting their adaptation to the digital age. Furthermore, instructors can develop educational materials that are more interactive and technology-driven (Poolklai,S, 2021).

The Planning, Budgeting, and Quality Assurance Division of the Office of General Education and Innovative Electronic Learning has implemented the use of digital media and technologies for the fiscal year 2025. Tools such as **Looker Studio** have been adopted to transform analytical data into user-friendly visual reports. These tools allow for seamless data integration and produce easily interpretable visual outputs.

Therefore, the researcher recognized the importance of this transformation and developed the R2R research project titled: **"Design and Development of a Dashboard System for Monitoring Operational Plans for Organizations."** The objectives of this study are:

1. To examine the design and development of a Dashboard system for reporting progress based on strategic performance indicators.
2. To analyze data management methods and develop effective data visualization formats using Dashboard tools to enhance system usability before and after implementation.

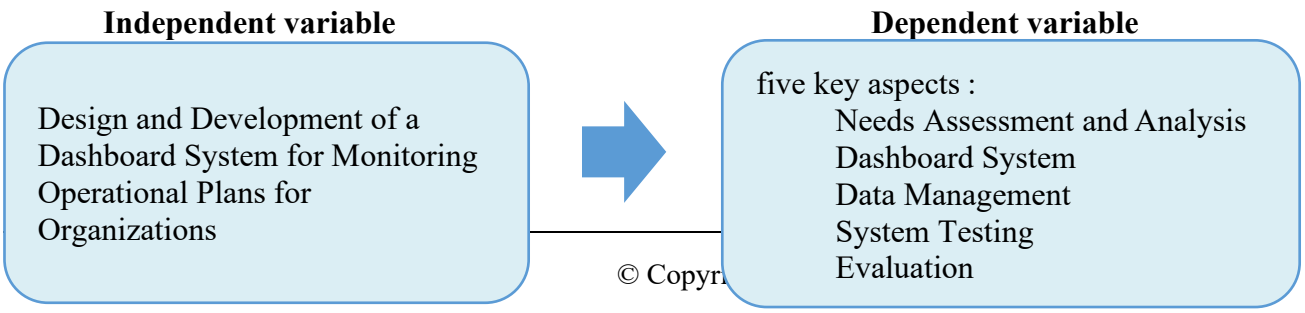
This innovation applies digital dashboard tools such as **Google Sheets, Power BI, and Looker Studio**. The integration of technology in planning operations can enhance organizational performance and efficiency. This approach is consistent with the research conducted by **Sumalee Tientongdee (2023).**

1.1 Research Objectives

1) To study the design and development of a dashboard system for reporting progress based on strategic performance indicators.

2) To analyze data management methods and develop data presentation formats using a dashboard in order to enhance system efficiency.

2. Conceptual Framework



Conceptual Framework :

The Dependent Variable is the use of Google Sheets and Looker Studio, which is examined across five key aspects:

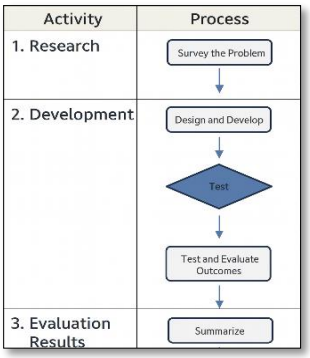
1. Needs Assessment and Analysis: Analyze the indicators and data required for monitoring.
2. Dashboard System Development:
   Design the structure and components of the Dashboard.
3. Data Management:
   Collect and organize the data, and integrate data in real time.
4. System Testing:
   Test the Dashboard system and improve it based on user feedback.
5. Evaluation:
   Compare the efficiency before and after the implementation of the Dashboard and measure user satisfaction.

3. Methodology

The researcher conducted a study titled " Design and Development of a Dashboard System for Monitoring Operational Plans for Organizations," with two main objectives: 1) To study the design and development of a dashboard system for reporting progress based on strategic performance indicators. , and 2) To analyze data management methods and develop data presentation formats using a dashboard in order to enhance system efficiency. (Pataranutaporn, P,2013). The survey respondents included 30 university staff members. Training sessions were held on the online platforms Looker Studio (Data Studio). For data analysis, **the researcher used the methods as follows:** Qualitative Data Analysis: Data from responses were analyzed using content analysis, followed by calculating percentages and averages to interpret the findings.

Research Hypotheses

- Participatory Action Research (PAR) This study employs Participatory Action Research (PAR), which emphasizes collaboration among stakeholders throughout the research process, from problem identification to planning, implementation, reflection, and improvement.
- Workflow (Flow of Procedures) The workflow outlines the steps used in conducting the research, covering needs assessment, dashboard development, data management, system testing, and evaluation.



1. **Analysis of respondents' demographic information** using descriptive statistics.
2. **Analysis of satisfaction** using a questionnaire to assess opinions related to the activity.
3. **Statistical analysis using the arithmetic mean (Mean).**
   The mean value can be calculated using the following formula:

$$\bar{X} = \frac{\sum X}{n}$$

Percentage is calculated by converting a ratio into a value out of 100, based on the following formula:

$$Percentage = \frac{Value\ to\ be\ calculated}{Total\ value} \times 100$$

4. Result

The researcher conducted a study on the " Design and Development of a Dashboard System for Monitoring Operational Plans for Organizations " with two main objectives: 1) To study the design and development of a dashboard system for reporting progress based on strategic performance indicators. , and 2) To analyze data management methods and develop data presentation formats using a dashboard in order to enhance system efficiency. Based on the collected data, the research findings are summarized as follows:

Satisfaction Assessment of Online Cloud Digital Media Platforms

The survey assessed satisfaction with cloud digital platforms across several sub-categories:

Aspect of Understanding	Mean ($\bar{x}$)	Percentage	Level of Satisfaction
1) Appropriateness of transforming traditional reports into a Dashboard format	4.63	92.50	Highest
2) Single-type chart, but multiple chart types	4.43	88.50	High
3) Displaying both charts and numerical tables	4.18	83.50	High
4) Using two colors in Dashboard design	4.43	88.50	High
5) Using three colors in Dashboard design	4.68	93.50	Highest
Overall	4.47	89.30	High

Detailed Results

From the table above,it was found that the appropriateness of transforming traditional reports into a Dashboard format was rated at the highest level ($\bar{x}$ = 4.63). The use of a single chart type, as well as multiple chart types, was rated at the highest level ($\bar{x}$ = 4.43). Displaying

both charts and numerical tables was rated at a high level ($\overline{x}$ = 4.18). The use of two colors in Dashboard design was rated at a high level ($\overline{x}$ = 4.43), while the use of three colors was rated at the highest level ($\overline{x}$ = 4.36). Overall satisfaction with Dashboard design was rated at a high level ($\overline{x}$ = 4.47).

5. Conclusion

The research on the " Design and Development of a Dashboard System for Monitoring Operational Plans for Organizations " involved an analysis of responses from 30 participants. The findings indicate that digital media was developed using online platforms to communicate the organization's performance effectively. (Pramanee, N, (2017). The developed media successfully facilitated the communication of organizational outcomes, as illustrated in the image below.

Examples of the outputs include work created with Looker Studio (Google Data Studio).

Looker Studio (Google Data Studio) Project Example

Reporting on the Design and Development of a Dashboard System Using Looker Studio (Data Studio) for Monitoring Organizational Operational Plans with Real-Time Data Integration:

1) **Application of Various Cloud Digital Media for Communication**: Study Learning Style through Cloud Computing Technology in General Education Courses at Suan Sunandha Rajabhat University. The use of digital media and technology in work practices provides a new

alternative for integrating technological tools into professional operations. This approach enables personnel to fully leverage technology to its maximum potential. It also serves as a model for learners to apply in business contexts or in their daily lives, aligning well with the demands of the digital era. Furthermore, instructors can develop learning materials that support effective learning online platforms such as “Looker Studio (Google Data Studio),” (Poolklai, S, 2021**)**

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